Letter to the Editor

Central venous access training simulator that enables dilator or catheter insertion

Dear Editor,

Various simulation-based training systems for central venous catheter (CVC) insertion have been developed all over the world.[1,2] Central venous catheter insertion simulators are designed to provide good ultrasound view to facilitate guidewire insertion; however, we were unable to insert a dilator or catheter using conventional CVC insertion simulators. Thus, the conventional CVC simulators do not sufficiently address the various cautions and complications regarding dilator/catheter insertion and fixation. Recently, a new CVC simulator (CVC Placement Pad; Kyotokagaku, Kyoto, Japan) has been developed (Fig. 1a,b) that offers efficient training in guidewire insertion as well as dilator and catheter insertion and fixation. This simulator contains water-soluble gel instead of conventional polyurethane foams, and enables simulated insertion of a dilator or catheter. We evaluated the utility of the new CVC insertion simulator with 15 anesthesiologists performing ultrasound-guided central venous catheterization. The anesthesiologists each had 6.9 ± 3.2 years of clinical experience and had performed ultrasound-guided CVC access 140.7 ± 96.2 times. All anesthesiologists acknowledged the utility of the simulator and confirmed that it mimicked clinical situations (Fig. 1c,d). Approximately 75% of the anesthesiologists agreed with the importance of CVC training including catheter insertion and fixation (Fig. 1e). This new simulator will offer more realistic training, leading to improvements in CVC safety.

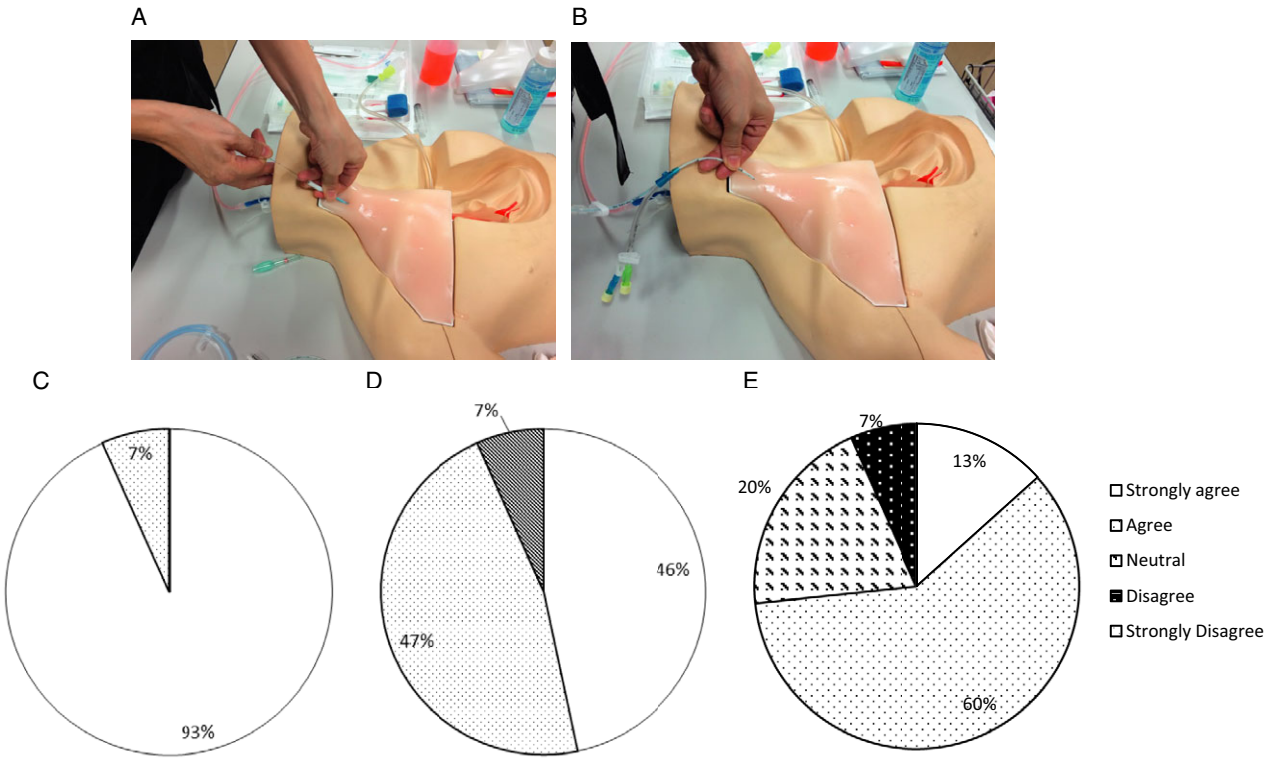

Fig. 1. Newly developed central venous catheter (CVC) simulator and evaluation by anesthesiologists. A, Representative photograph of dilator insertion into the new CVC simulator. B, Representative photograph of catheter insertion to the new CVC simulator. C–E, Study participant responses: Is this simulator useful in CVC access training? (C) Does this simulator mimic clinical CVC access? (D) Should CVC simulator training include catheter insertion or fixation? (E).

To maximize the medical safety regarding CVC, simulation-based CVC access training should allow trainees to not only enhance ultrasound-guided techniques but also learn how to prevent various complications such as mechanical insertion trouble, arrhythmia, infection, pneumothorax, and cardiac arrest. For future directions, more sophisticated high-fidelity simulators for CVC insertion and prevention of various complications should be developed.

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CONFLICT OF INTEREST

NONE.

REFERENCES

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2 Madenci AL, Solis CV, de Moya MA. Central venous access by trainees: A systematic review and meta-analysis of the use of simulation to improve success rate on patients. Simul. Healthc. 2014; 9: 7–14.